REMARKS

Reconsideration of this application as amended is respectfully requested.

In the Office Action, claims 1-6, 13 and 15-23 were pending and rejected. In this response, no claim has been canceled. Claims 1 and 22-23 have been amended to particularly point out and distinctly claim, in full, clear, concise, and exact terms, the subject matter which Applicant regards as his invention. The support of the amendments can be found throughout the specification of the present application, such as, Fig. 1A and pages 33-41 of the specification. No new matter has been added.

Claims 1-6, 13 and 15-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) U.S. Patent No. 5,867,397 to Koza et al. (hereinafter "Koza") in view of AAPA Ullman, "An Algorithm for Subgraph Isomorphism" (hereinafter "Ullman"), and in view of Beasley et al., "An Overview of Genetic Algorithms" (hereinafter "Beasley").

In view of the foregoing amendments, it is respectfully submitted that the present invention as claimed includes at least one limitation that is not disclosed or suggested by the cited references and thus is patentable over the cited references. Specifically, for example, independent claim 1 as amended recites as follows:

> 1. A computer-implemented process for creating an entity that satisfies a predetermined design requirement that at least one characteristic is not in a reference structure, the process comprising:
>
> initializing a plurality of candidate entities and an iteration count with a predetermined value by supplying, from an external source, at least one candidate entity partially satisfying the predetermined design requirement which includes a characteristic of the reference structure to the initialized plurality of candidate entities, wherein each candidate entity is represented by a tree structure having a plurality of nodes representing a structure of the candidate entity;
>
> performing iterative genetic programming operations, each iteration including:

creating a description of the structure for each of the candidate entities based on its tree structure,

analyzing behavior and characteristics based on the description of the structure of each candidate entity, including a simulation of the structure,

comparing each of the plurality of candidate entities with the reference structure based on the analysis of the behavior and characteristics to obtain an isomorphism value for each candidate entity, the isomorphism value representing a dissimilarity between the respective candidate entity and the reference structure,

determining a fitness value for each of the candidate entities based on a compliance with the predetermined design requirement and the isomorphism value of the respective candidate entity,

selecting at least one candidate entity from the plurality of candidate entities that has a fitness value exceeds a predetermined threshold,

creating at least one new candidate entity by creating a variation in the selected at least one candidate entity if the selected at least one candidate does not satisfy the predetermined design requirement or a number of iterations has not reached the predetermined value of the iteration count, including probabilistically performing one of a reproduction operation, offspring crossover operation, mutation operation, and an architecture altering operation on the at least one selected candidate entity, and

terminating the iterations if the selected at least one candidate satisfies the predetermined design requirement or a number of iterations has reached the predetermined value of the iteration count, wherein at least one of the selected candidate entities is used to design an end-result structure in view of the predetermined design requirement, wherein the end-result structure does not possess key characteristics of the reference structure; and

updating the iteration count at the end of each iteration.

(Emphasis added)

It is submitted that the cited references fail to disclose or suggest the limitations of creating a description of the structure for each of the entity candidates based on its tree structure representation, analyzing behavior and characteristics based on the description of the structure of each candidate entity, including a simulation of the structure, and comparing each of the candidate entities with the reference structure based on the analysis of the behavior and characteristics to obtain an isomorphism value for each candidate entity, where the

isomorphism value is used to determine the fitness of the entity in order to derive the best candidate.

Although Ullman discloses an isomorphism algorithm, there is no suggestion within Ullman to combine with Koza, or vice versa. In fact, there is no mention of Ullman or the term of "isomorphism" in Koza. The fact that the present application references Ullman and its isomorphism algorithm in the specification does not provide any motivation for one with ordinary skill in the art, based on the teachings of Ullman and Koza, to combine Ullman and Koza. Any suggestion to combine Koza and Ullman can only be based on the hindsight of the specification of the present application.

In addition, the cited references fail to disclose the limitation of performing one of a reproduction operation, offspring crossover operation, mutation operation, and an architecture altering operation on the at least one selected candidate entity.

Although Beasley discloses an introduction of genetic algorithms, Beasley fails to disclose the specific limitations of genetic programming techniques set forth in independent claim 1. The present invention as claimed is not merely about genetic algorithms or genetic programming. Rather, the present invention as claimed is about a specific way to design structures using genetic programming techniques.

In order to render a claim obvious, each and every limitations of the claim must be taught by the cited references, individually or in combination. It is respectfully submitted that Koza, Ullman, and Beasley, individually or in combination, fail to disclose or suggest each and every limitations of independent claim 1. Therefore, for reasons set forth above, it is respectfully submitted that independent claim 1 is patentable over Koza, Ullman, and Beasley.

Similarly, independent claims 22-23 include limitations similar to those recited in claim 1. Thus, for the reasons similar to those discussed above, independent claims 22-23 are patentable over Koza, Ullman, and Beasley.

Given that the rest of the claims depend from one of the above independent claims, at least for the reasons similar to those discussed above, it is respectfully submitted that the rest of the claims are patentable over Koza, Ullman, and Beasley.

In view of the foregoing, Applicant respectfully submits the present application is now in condition for allowance. If the Examiner believes a telephone conference would expedite or assist in the allowance of the present application, the Examiner is invited to call/email the undersigned attorney.

Please charge Deposit Account No. 02-2666 for any shortage of fees in connection with this response.

Respectfully submitted,

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